

J. B. BENTON.
Fare Register

No. 233,915. *Fig. 1.* Patented Nov. 2, 1880.

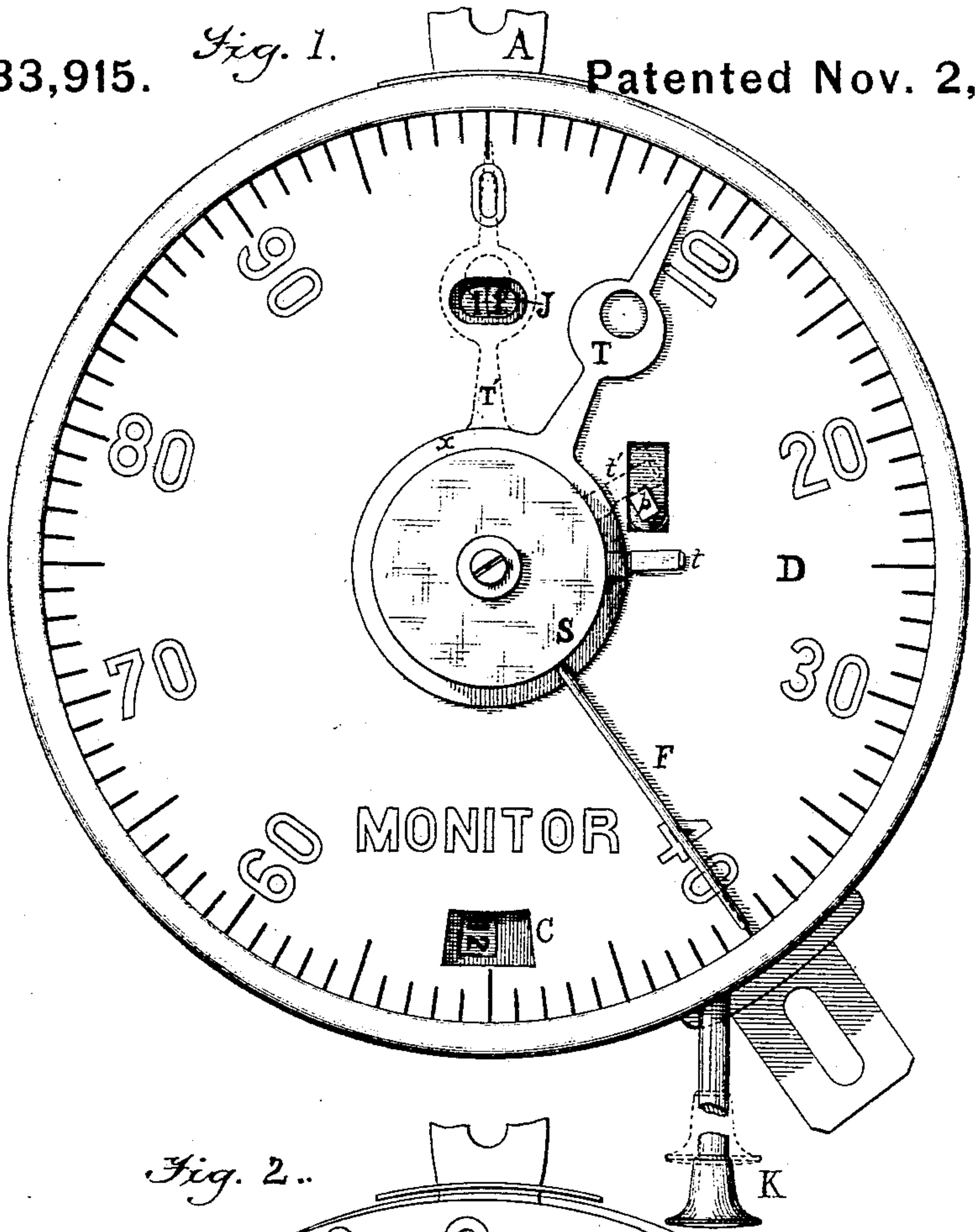
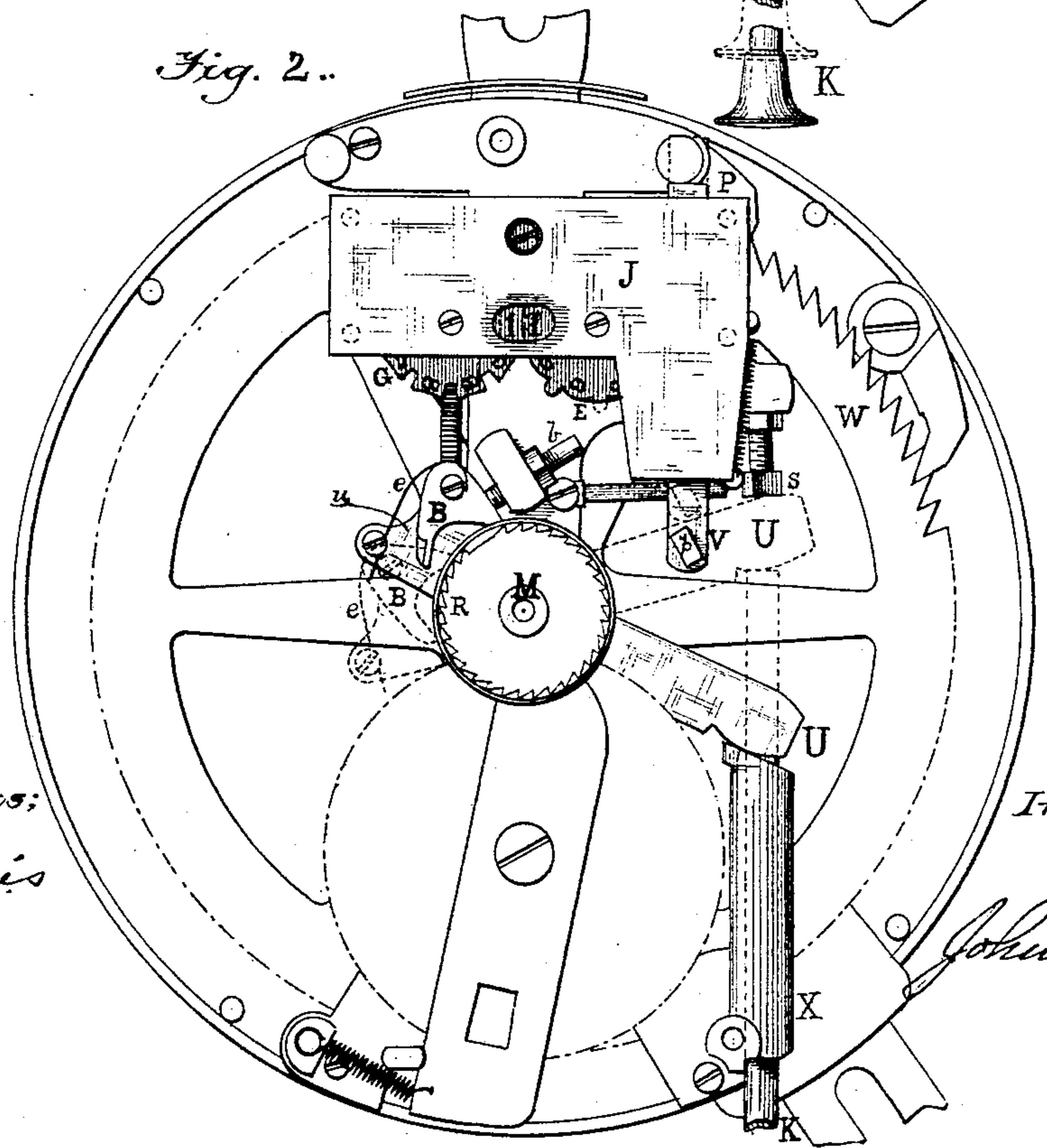


Fig. 2.



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2 Sheets—Sheet 2.

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Fig. 3.

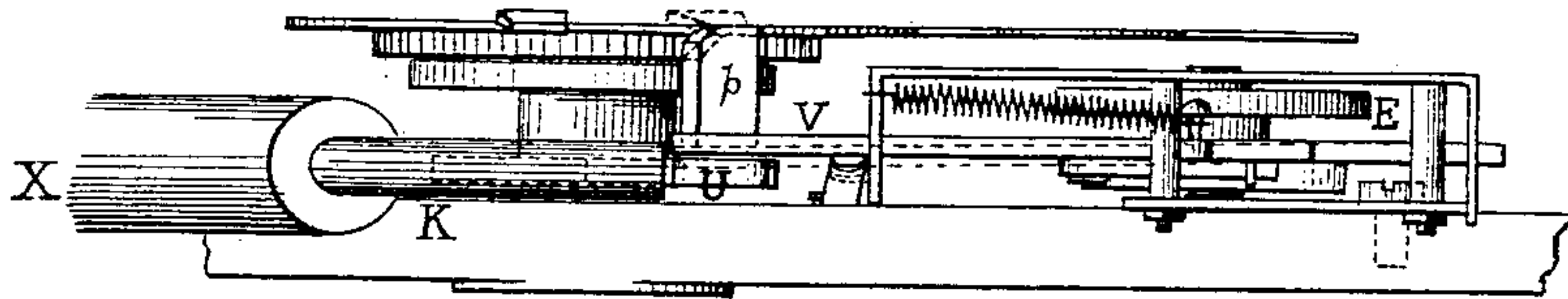


Fig. 4.

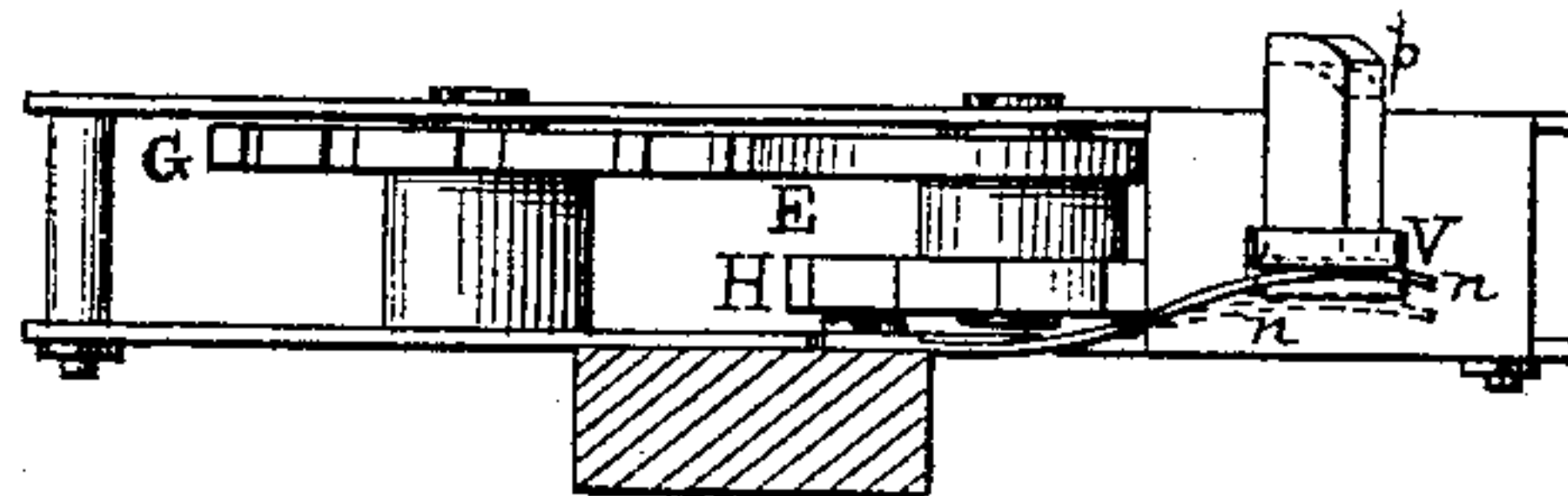
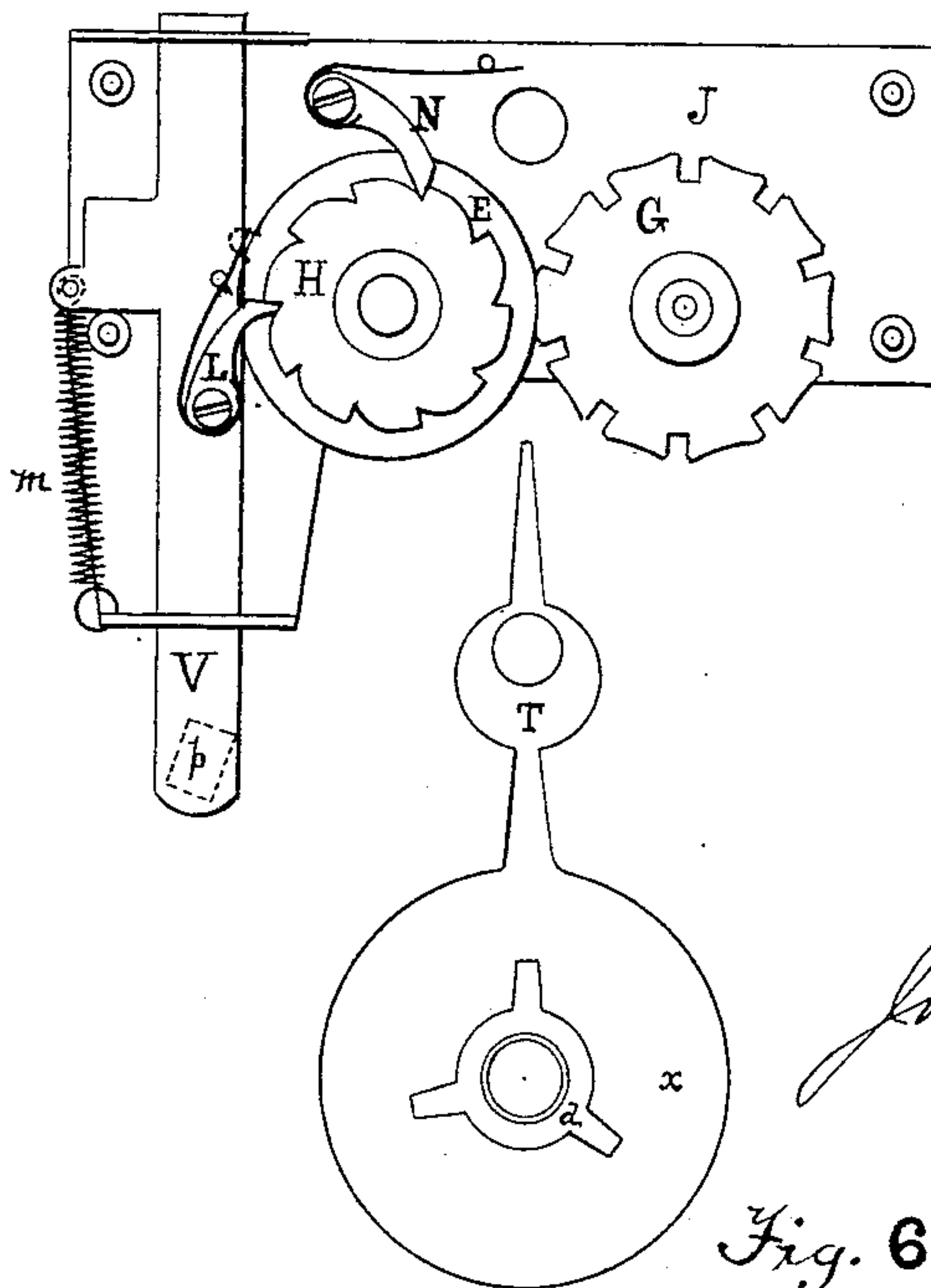


Fig. 5.



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Fig. 6.

UNITED STATES PATENT OFFICE.

JOHN B. BENTON, OF ROSELLE, NEW JERSEY, ASSIGNOR TO THE RAILWAY REGISTER MANUFACTURING COMPANY, OF BUFFALO, NEW YORK.

FARE-REGISTER.

SPECIFICATION forming part of Letters Patent No. 233,915, dated November 2, 1880.

Application filed January 3, 1878.

To all whom it may concern :

Be it known that I, JOHN B. BENTON, of Roselle, in the county of Union and State of New Jersey, have invented certain new and
5 useful Improvements in Registering or Counting Machines, of which the following is a specification.

My invention relates to apparatus more particularly designed for registering or tallying
10 the number of fares collected by conductors on cars or other public passenger-vehicles, whereby, as the collector is required to operate the register each time he receives a fare and sound an alarm, fraud and cheating by false
15 returns are prevented.

My improvements belong more especially to fare-registers of the class embodying in their structure and organization, first, mechanism
20 for registering, recording, or tallying the number of fares received, or actuations of the mechanism made during a single trip of the car or vehicle, and capable of being set to zero or the starting-point at the end of the trip, usually termed a "trip-register;" second,
25 mechanism for registering, recording, or tallying the same actuations that the trip-register does, and also continuously counting or tallying the whole number of fares for a large number of consecutive trips, usually termed a
30 "general," "permanent," or "continuously-counting" register, and which is not adapted to be reset or brought to zero at the end of each trip; third, mechanism for registering, recording, or tallying the number of times the
35 trip-register has been set to zero, usually termed a "zero-register;" and, fourth, mechanism for sounding an alarm each time the trip and general registers are actuated, whereby the passenger is notified of the proper registry of
40 his fare.

My present invention constitutes an improvement upon the mechanism and upon the organization of parts shown in Letters Patent
45 of the United States No. 167,057, granted to me August 24, 1875, the object of my invention being to improve the construction of such registers.

The subject-matter claimed will hereinafter specifically be designated, and then pointed
50 out at the close of the specification.

The accompanying drawings illustrate an apparatus embodying all my improvements in the best way now known to me; obviously, however, some of them may be used without the others, and in machines differing somewhat
55 from that therein shown.

Figure 1 is a front or face view of the machine; Fig. 2, a similar view thereof with the front or dial plate removed, as also the index-
60 hands; Fig. 3, a side view of a portion of the zero gathering or resetting devices and register; Fig. 4, a view thereof from below; Fig. 5, a view of the zero-register from the back, and Fig. 6 a view of the trip-hand with its
65 friction carrying-spring.

My present register resembles in its general features the well-known "Monitor" fare-register, shown in reissued Letters Patent No. 7,290,
70 granted to H. E. Towle and myself, jointly, September 5, 1876, and in my aforesaid Letters Patent No. 167,057. It will therefore be unnecessary to show in the drawings or describe herein in detail all the parts necessary
75 to a complete machine, inasmuch as they are fully and elaborately shown and described in said patents, and I will, consequently, content myself with a detail description of the mechanism so far only as is necessary to a complete
80 understanding of my present improvements.

The prime mover or actuator consists, in
80 this instance, of a pivoted or vibrating lever, A, extending through a slot in the edge of the case, and may be operated either directly by the hand or through some intermediate attachment, as fully described in the aforesaid
85 patents. The lever is provided with an actuating-pawl, P, (shown in Fig. 2,) which engages with a ratchet-wheel, W, the said lever, in this instance, through the medium of this
90 wheel W, serving to actuate simultaneously, or nearly so, the trip-register, the general register, and the alarm.

The ratchet-wheel W is mounted upon and keyed to a central axis or main shaft, M, with
95 which it turns, the rear end of said shaft being fitted in a suitable bearing in the back or base plate of the casing, while it is also fitted, near its front end, in a suitable bearing in a supporting-plate or cross-bar resting upon or secured to suitable posts rising from the base-
100

plate, as usual. The said shaft carries upon its front end, in front of said supporting-plate, index fingers or pointers T and F, which constitute, in connection with a graduated dial or indicator-disk, D, the trip-register and general register, respectively, the finger T being the pointer or index-finger of the trip-register, while the finger F is the pointer or index-finger of the general register.

The fingers T F project from disks x S, respectively, as clearly shown in Fig. 1, the disk x being below or behind the disk S. Said disk x is also provided at its back with, or securely connected to, a ratchet-wheel, R, having its teeth running in the opposite direction to those on the wheel W, both the disk and its ratchet-wheel being loosely mounted upon the main shaft, while the disk S, carrying the pointer of the general register, is firmly secured (screwed or keyed) to the said shaft, so as to turn positively therewith.

In order to compel the trip-hand, thus loosely mounted upon the main shaft, to turn with said shaft as it is being revolved, step by step, by the actuations of the ratchet-wheel W, owing to the reciprocations, vibrations, or movements of the actuator or lever A, I interpose between the disks x and S an elastic substance under tension, (or a suitable clutch,) consisting, preferably, of a spring-washer, d , provided, in this instance, with three bent arms or projections, radiating from a flat central portion, having a central opening to permit the washer to be passed upon the shaft, the said arms of this tripod spring-washer being so bent or curved that only their extremities rest upon the disk x , the flat or plane central portion of the washer resting against the back of the plate S, or upon a suitably-interposed washer of ordinary construction. It will thus be seen that as the main shaft revolves, owing to the actuations of the wheel W, the fingers T F also revolve—the finger F on account of being fixed to the shaft, and the finger T on account of the friction caused by the interposed spring-washer.

The actuator of the register operates the wheel W preferably upon the back-stroke—that is, the lever is vibrated in one direction, by the actuating force, against the tension of an impelling-spring, which spring, as soon as the force is removed, throws the lever in the other direction, and, by the engagement of the pawl P with the teeth of the wheel W, moves or turns said wheel the distance of one tooth, or one one-hundredth of a revolution, (the wheel having one hundred teeth corresponding to the graduations on the dial D;) and inasmuch as the wheel W is keyed or fixed upon its shaft, said shaft, when the wheel is actuated, is also turned one one-hundredth of a revolution, consequently carrying the index-fingers mounted thereon the same distance, or the distance of one point on the graduated dial, thereby indicating that one fare has been collected.

At every actuation of the register an alarm is sounded, the bell-hammer of the alarm apparatus being connected to and raised by a pawl acted upon by a spring, which pawl, as the actuating-wheel W revolves, rides over one tooth in the wheel and falls into the notch immediately following, the momentum thus given to the hammer being sufficient to cause it to strike the bell and sound the alarm, all of which movements of the wheel W are fully described in my aforesaid Letters Patent No. 167,057. Each successive operation, therefore, of the actuator A adds one point to the number indicated by the index-fingers on the dial, and also sounds an alarm.

The finger F, in connection with the graduated-dial D, constitutes the general or continuously-counting register, as hereinbefore stated—that is, said finger is not adapted to be set back at the end of a trip.

In order to give the general register a capacity of continuously registering and preserving a record of a large number of fares, there is added a multiplying-wheel of well-known construction, which wheel is, at every complete revolution of the wheel W of its shaft, and consequently of the index-finger F, turned one point, or the distance of one tooth, by a tongue or projection on a suitable hub mounted upon said shaft. This multiplying-wheel is preferably constructed to operate on the principle of the well-known Geneva stop, so as to keep it locked except when actuated by the tongue or projection on the main shaft. The front face of the multiplying-wheel is provided with numbers or figures corresponding to the number of teeth in its periphery, the figures showing through the aperture C in the dial-plate successively as the wheel is turned, so as to permit of readily reading or inspecting the indications of the register.

The index-finger T, in connection with the dial D, constitutes the trip-register, as hereinbefore stated. In order to give said trip-register the capacity of being turned back to zero or the starting-point at the beginning of each trip, or whenever desired, I have mounted said finger upon the main shaft in the manner hereinbefore described—that is, in a manner to compel its movement in unison with the index-finger F of the general register in a forward direction when the mechanism is being operated by means of a friction or other suitable clutch, while movable backward independently of the general register without disturbing or destroying the integrity of the record made by such general register, the pawl of the bell-hammer serving to hold the actuating-wheel W from all backward movement.

In order to accomplish the backward, returning, or resetting movement of the trip-hand, I employ mechanism preferably actuated step by step for the purpose, consisting, in this instance, of a movable or vibrating pawl-carrying plate, mounted upon the main shaft as a center, and back of or below the disk x of the

trip-hand, the pivoted pawl B of said plate operating upon the projections or ratchet-wheel R of the said disk x . The pawl-carrying plate is provided with a radial arm or projection, U, by which to actuate or move it in one direction—that is, in the direction to allow the pawl B, which is acted upon by a suitable spring, e , to vibrate into engagement with the teeth of the ratchet-wheel on the disk x , and thereby, owing to the movement of the plate, turn said disk to carry the index-hand backward, the movement of the plate around the main shaft being limited by a stationary abutment, s , against which the arm U comes in contact on the upstroke. A suitable spring acts upon the arm U of the pawl-carrying plate to return or move said plate in the opposite direction in readiness for a new actuation, the movement of the said plate in this direction being limited by a stationary abutment or screw, b , against which the pawl B abuts or comes in contact, and by which said pawl is lifted out of the teeth of the ratchet-wheel R, as shown in Fig. 2, in order that no obstruction be presented to the movements of the trip-register when actuated by the prime mover.

It will be obvious that it is necessary to impart a step-by-step or repeated movement to the pawl-carrying plate to complete the resetting movement of the trip-hand, if that hand should have been carried far enough around by actuations during the trip to render one actuation of the plate insufficient to carry the hand to zero; and in order to actuate the plate from the outside of the casing I preferably employ a removable reciprocating key or pusher, K, which is inserted and guided, when in use, in a tube, X, an inward movement of the pusher carrying its inner end against the arm U of the pawl-carrying plate and turning it upon its axis. The pusher is thrown outward after every inward movement by the returning-spring of the plate, as will be obvious, in readiness for another reciprocation.

In order to prevent the trip-hand from being carried beyond zero or the starting-point when being returned at the end of a trip or otherwise, a recess is formed in the ratchet-wheel R, or some of its teeth omitted, as clearly shown in Fig. 2, whereby, in connection with the stationary pin or abutment s , by which the movement of the pawl-carrying plate is limited, the pawl is prevented from acting upon the teeth of the wheel, and consequently cannot move said wheel, or the trip-hand secured thereto, beyond zero.

In order to record and indicate the number of times the registering mechanism has been set to zero the following arrangement is employed: An endwise-moving or sliding bar, V, stands in its normal position, as shown in Figs. 2 and 3, so that when the arm U is actuated by the key or pusher K it passes under and clear of said bar, the lower end of which is capable of being slightly depressed, and is

provided with a post or lug, p , having a rounded or beveled top, as clearly shown in the drawings.

Fastened or secured to the disk x , which carries the trip-hand, is a projection, t , so organized that as the trip index-finger approaches zero in being reset by the pusher K acting upon the pawl-carrying plate, the said projection t approaches the post p , the highest point of the top of which post, in its normal position, is above the under side or back of the projection t , while the lower part of said top is on a level with the under side or back of said projection, whereby, when the projection t comes in contact with the post p and slides upon its top, said post, together with the end of the bar V, is cammed down or depressed against the tension of a light plate-spring, n , in such manner that when the arm U is again actuated it comes in contact with the end of the bar V, moving it endwise until the said arm U comes in contact with the abutment s , or, in other words, reaches the limit of its movement.

Upon the under side of the bar V is pivoted a pawl, L, which, upon the upstroke of the bar, engages a ratchet-wheel, H, fixed to the under side of a circular plate, E, or to the axis or journal thereof, to actuate it.

The upper side or front face of the plate E is provided with the numbers 0 to 9, inclusive, and, in connection with a second circular plate or wheel, G, similarly numbered, and operating, preferably, on the principle of the Geneva stop, constitutes the zero-register, one number only at a time of each wheel being visible through an aperture cut in the front bearing-plate, J, of the zero-register wheels, and also in the dial D.

Each upstroke or actuation of the bar V causes the pawl L, as before stated, to engage and revolve the wheel H the distance of one tooth, or one-tenth of a revolution, exposing the next highest number on the wheel E through the inspection-aperture, and by the time this effect has been produced in the zero-register the trip-hand has reached zero, or the position indicated by the letter T', Fig. 1, while the projection t has passed over and beyond the post p and stands in the position shown at t' . The end of the bar V, and consequently, also, the post p , then rise or assume their normal positions, as maintained by the spring n , and the arm U cannot again engage the bar until the index-finger T has been moved away from zero by the actuation of the prime mover of the register, nor until said trip-hand is again being returned to zero, as before. The record of the zero-register consequently remains unchanged until the hand T again arrives at zero, when the next consecutive number will be shown, thus indicating at a glance the number of times the trip-registering mechanism has been set to zero.

The actuating ratchet-wheel H of the zero-register is prevented from back movement by

a suitable pawl, N, while the bar V, when relieved from contact with the arm U, is returned to its normal position by the action of a suitable spring, m.

5 Believing that the foregoing description will enable those skilled in the art readily to understand my invention and the mechanism shown for carrying it into effect, elaboration as to its operation and advantages is deemed unnecessary.

10 I disclaim herein, in favor of my application filed July 9, 1880, all the patentable subject-matter of my present invention save that covered by the following three clauses of claims, it being the intention to cover and include in
15 this case only the three combinations of mechanism recited in said claims, while all the other patentable features, parts, or combinations of my invention are intended to be covered by the
20 claims of my said application of July 9, 1880, which is filed as a division and continuation of this present application.

What I claim as my invention is—

25 1. The combination, substantially as hereinbefore set forth, of a registering-wheel or index-hand, actuated in one direction in the process of counting and capable of being moved in the other direction to reset or carry it to zero, a resetting wheel or teeth connected with said
30 registering-wheel or index-hand, a movable plate or pawl-carrier, inclosed within the register-casing, acting upon said resetting wheel or teeth, and a removable reciprocating push-key to actuate said plate or carrier.

35 2. The combination, substantially as hereinbefore set forth, of a turning-shaft, a toothed wheel to actuate said shaft, a trip index-hand

or registering-wheel connected with said shaft by a friction clutch or coupling which compels the said index-hand or registering-wheel to
40 move with said shaft in the process of counting, while allowing said index-hand to be moved upon said shaft to reset it or bring it to zero, resetting teeth or projections connected with
45 said index-hand, a movable plate acting upon said projections of the index-hand, a pusher or key movable endwise to actuate said movable plate in one direction, and a spring to move
50 said plate in the opposite direction, or to return the plate to the position from which it was moved by said pusher.

3. The combination, substantially as hereinbefore set forth, of a trip-register, a general register, a prime mover or handle for actuating said registers simultaneously, or nearly so,
55 and a resetting mechanism for the trip-register, consisting of a toothed wheel or projections connected with the trip-register, a backward-and-forward movable plate acting upon said
60 projections, a reciprocating key or pusher to actuate said plate in one direction, and a spring to move the plate in the opposite direction to that imparted by said key, whereby the said
65 trip-register is permitted to be moved with the general register clear of the resetting-plate in the process of counting, while capable of being reset by said plate by the simple reciprocation of the key or pusher without disturbing the record of said general register.

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Witnesses:

C. B. HARRIS,
GEO. H. EVANS.